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L9	(SUGIYAMA-NAONOBU$ or TOTANI-KAZUO$ or KONDO-HIROMASA$).in.	301	L9
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DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ			
L3	(ink jet or ink-jet or inkjet).ti. and ((support or substrate) same (opacity or opaue))	111	L3
L2	(ink jet or ink-jet or inkjet).ti.	117570	L2
L1	(6096469 or 6436515).pn.	4	L1

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(54) INK JET RECORDING SHEET

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain an ink jet recording paper having the vividness of images in both of an incident light and reflected light, and also having good appearance in a blank paper and five coating strength.

SOLUTION: This ink jet recording sheet consists of an ink receptor layer containing amorphous fine silica and binding agent on a carrier, in which the carrier consists mainly of polyolefin resin containing nonorganic pigment, and is made of biaxially-oriented resin film of an opaque degree of 60% or less, and an opaque degree of the whole recording sheet is in the range of 66-85%.

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CLAIMS

[Claim(s)]
[Claim 1] The sheet for ink jet record with which it consists of a resin film which uses as a principal component the polyolefin resin in which a base material contains an inorganic pigment in the sheet for ink jet record which comes to prepare the ink absorbing layer containing amorphous pulverizing silica and a binder on a base material, and which carried out biaxial extension, and the opacity of the whole sheet for record is characterized by 66% or more being 85% or less by the opacity of this base material 60% or less.
[Claim 2] The sheet for ink jet record indicated by claim 1 in which an ink absorbing layer contains water-soluble cation resin further.
[Claim 3] The sheet for ink jet record with which the opacity which has the under coat layer in which oil absorption contains a pigment (100ml / 100g or less) and a water compatibility macromolecule binder, and united the base material and the under coat layer between the base material and the ink absorbing layer is 60% or less, and the opacity of the whole sheet for record was indicated by claim 1 which is 85% or less, or 2 66% or more.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the sheet for ink jet record which has the property which could print at high speed using the printer of an ink jet method, has the permeability which was excellent in display with the so-called back light method by the transmitted light from a rear face, and could moreover display the image skillfully also in the reflected light in detail about the recorded material, and was excellent in paint film reinforcement.
[0002]
[Description of the Prior Art] More advanced properties, such as high-speed absorptivity, high absorption capacity, and a regular ink blot, come to be required also from a recorded material, and the so-called coating type of inkjet printing paper [many] which prepared the ink receptiveness coating layer in the front face are developed by the improvement in the engine performance of the printer of an ink jet method especially a print rate, resolution, saturation, etc.
[0003] Moreover, the application as an advertisement (it abbreviates to point of purchase advertising below) is mainly circulated from office documents, such as the conventional document, with application expansion of an ink jet printer in recent years at the advertising object [using a color], especially purchase time. Since it is not necessary to engrave unlike printing, even if ink jet record is little, it can be printed, and has the merit that cost also becomes cheap. Furthermore, the sheet for ink jet record which can be used for the method which looks at an image with the light which irradiates light and is penetrated from the background of not only the method that looks at an image with the light which irradiates light and is reflected to the image formed in the conventional space as the application as point of purchase advertising is extended but an image, and the so-called back light method is needed.
[0004] Since an image can be seen by the reflected light daytime using the natural light and it can see by the transmitted light by the back light at night when seeing the image recorded on such a sheet for ink jet record, it excels also from a viewpoint of energy saving or environmental protection. That is, the record medium which can be seen by both the reflected light and the transmitted light is called for by the end of today. In order to solve this problem, using for a base material the synthetic paper which carried out biaxial extension is indicated by JP,7-089218,A. However, the record form currently indicated by JP,7-089218,A had low opacity, the clear nature of the image by the reflected light was low, and the light source was what is transparent from a front face and is not suitable for this purpose in the back light method by incident light.
[0005] Furthermore, following two exist in the approach of seeing these record objects. That is, (1) base-material side is used as a rear face, and the method (2) ink-absorbing-layer side which looks at an image from an ink absorbing layer side is used as a rear face, and in order to see a direct image from an ink absorbing layer side in the method above (1) which looks at an image from a base material side, while it is easy to obtain a clear image, since a recording surface is outside exposed, the coloring matter of ink discolors with daylight or activated gas, or a front face becomes dirty, or it is easy to get damaged. Moreover, in the above (2), in the advantage and demerit, (1) becomes reverse. In order to prevent the

fault of the above (1), i.e., discoloration of ink coloring matter and surface dirt, a blemish, etc., it is effective to laminate a transparence resin film on a front face after record, but in order that a process may increase, it is inferior to convenience. In order to conquer the fault of being hard to obtain a clear image in order to see an image through the fault of the above (2), i.e., a base material, it is effective to make the opacity of a base material low. However, since the light source is in sight through a record object when seeing especially in the source of the transmitted light of a back light if opacity is too low, it will become unsuitable.

[0006] Especially this invention person etc. came to complete a header and this invention for the above-mentioned technical problem being solved, when coating of the ink absorbing layer is carried out to a base material and the base material which has the opacity of the specific range as a result of the wholeheartedly examination about the relation of the opacity of an ink absorbing layer and it considers as an ink jet record medium with the opacity of the specific range.

[0007]

[Problem(s) to be Solved by the Invention] This invention aims at offering the sheet for ink-jet record which has the property which can print at high speed using the printer of an ink jet method, has the permeability which was excellent in display with the so-called back light method by the transmitted light from a rear face, could moreover display the image skillfully also in the reflected light, and could use which by the side of a base material and an ink absorbing layer also as a front face, and was excellent in paint film reinforcement.

[0008]

[Means for Solving the Problem] Invention of the 1st of this invention consists of a resin film which uses as a principal component the polyolefin resin in which a base material contains an inorganic pigment in the sheet for ink jet record which comes to prepare the ink absorbing layer containing amorphous pulverizing silica and a binder on a base material and which carried out biaxial extension, and the opacity of this base material is related with the sheet for ink jet record with which the opacity of the whole sheet for record is characterized by being 85% or less 66% or more 60% or less. Moreover, invention of the 2nd of this invention relates to the sheet for ink jet record with which an ink absorbing layer contains water-soluble cation resin further in the 1st above-mentioned invention. Furthermore, the opacity to which invention of the 3rd of this invention has the under coat layer in which oil absorption contains a pigment (100ml / 100g or less) and a water compatibility macromolecule binder, and united the base material and the under coat layer (henceforth UC layer) between the base material and the ink absorbing layer in the 1st or 2nd above-mentioned invention is 60% or less, and the opacity of the whole sheet for record is related with the sheet for ink jet record which is 85% or less 66% or more.

[0009]

[Embodiment of the Invention] The thing which consists of polyolefin resin, for example, polyethylene, polypropylene, ethylene propylene rubber, and an ethylene-vinyl-acetate copolymer as thermoplastics, or the thing which makes these a principal component can be used for the base material film used for this invention. Polystyrene, an acrylic ester copolymer, etc. may be mixed and used as other thermoplastics. Into these thermoplastics, minerals impalpable powder is mixed and it forms at a film, and if biaxial extension processing of this is carried out, the sheet (paper-like layer) of the aesthetic property approximated to paper will be obtained. In this invention, it is desirable to use as a base material the multilayer film obtained by carrying out two or more laminatings of such a film. For example, use of the 2-3-layer film which consists of a base material layer, both sides, or an one side paper-like layer, or the 3-5-layer film which formed the surface layer on the paper-like layer of at least the one side further is effective. What is called a synthetic paper is contained in the film which consists of polyolefin resin containing the inorganic pigment of this invention, for example, the Oji-Yuka Synthetic Paper synthetic paper "YUPO" etc. is contained in it.

[0010] As minerals detailed powder blended with the thermoplastics used for this invention, a calcium carbonate, baking clay, diatomaceous earth, talc, a silica, etc. can be illustrated. As for the loadings of such minerals impalpable powder, it is desirable to consider as 8 - 65 % of the weight. At less than 8 % of the weight, when there is a possibility that achoring with a coating layer may fall and the

reinforcement of a paint film may fall and it exceeds 65 % of the weight, there is a possibility that the reinforcement of a base material may run short. On handling, such a film is and the about 15-200-micrometer thing of thickness is desirable.

[0011] The opacity of the base material used for this invention must be 60% or less. When the whole opacity builds 66% - 85% of sheet for record using the base material with which opacity exceeds 60%, a beam of light is penetrated from an ink absorbing layer side and it observes from a base material side, since the opacity of a base material is high, scattered reflection of the light is carried out within a base material, and a clear image is not obtained. Furthermore, 15% or more of the opacity of the base material of this invention is more desirable. When it is necessary to make the opacity of an ink absorbing layer high, and the opacity of a base material prepares the whole opacity to 66% - 85% using less than 15% of base material and a printing image is observed in incident light and the reflected light, the somber impression is received and a clear image may not be obtained.

[0012] The pigment used for the ink absorbing layer of this invention is the high oil absorption which enables clear coloring with the high and absorptivity of ink with porosity, and has high specific surface area, and the particle condensed the 2nd order is used. As such a particle, the amorphous pulverizing silica whose secondary particle diameter is 1-20 micrometers is desirable. Amorphous pulverizing silica can mix up silicate of soda and a sulfuric acid for high grade silica sand, can make a silicic acid sol able to generate, and can be obtained by the approach of making said silicic acid sol Miyoshi present target floc, temperature, ion, the method of carrying out stop sedimentation of the growth of secondary floc under the effect of a surfactant, or the approach by disassembly of a silicon tetrachloride. Moreover, according to the purpose of using a sheet, and the military requirement of a printer, it is possible one sort or to use together two or more sorts of other white pigments. As these white pigments, pigments generally used for paper coating, such as a calcium carbonate, baking clay, kaolin clay, talc, white carbon, and an organic pigment, are mentioned.

[0013] As a binder used for the ink absorbing layer of this invention Protein, such as polyvinyl alcohol and its derivative, and casein, starch, And conjugated diene system polymer latexes, such as the starch derivative, a styrene-butadiene copolymer, and a methyl methacrylate-butadiene copolymer, Acrylic polymer latexes, such as a polymer of acrylic ester and methacrylic ester, or a copolymer, Vinyl system polymer latexes, such as an ethylene-vinylacetate copolymer, or the carboxyl group of these various polymers, Functional-group content denaturation polymer latexes, such as a cationic radical, melamine resin, The aquosity adhesives of synthetic-resin systems, such as heat-curing resin, such as a urea-resin, a maleic-anhydride copolymerization resin system, Polyacrylamide system A polymethylmethacrylate system, a polyurethane resin system, Since compatibility with ink is good and absorbency is raised with macromolecules sufficient [an adhesive property with a pigment], such as synthetic-resin system adhesives, such as an unsaturated-polyester-resin system, a polyvinyl-butyral system, and an alkyd-resin system, it is used preferably. These binders may use two or more sorts together if needed.

[0014] Below the 100 weight sections of the rate of an use rate of the binder in an ink absorbing layer are desirable more than 10 weight sections to the pigment 100 weight section. When adhesive strength may become inadequate under in 10 weight sections, the reinforcement of a coating layer may fall and it exceeds the 100 weight sections on the other hand, an adhesive property has a possibility that the rate of an use rate of a pigment may fall although it becomes large, the absorptivity of ink may fall, and a blot may arise.

[0015] To the ink absorbing layer of this invention, the color enhancement of ink can be raised by containing water-soluble cation resin, and a skillful image can be obtained to it. As water-soluble cation resin used for the ink absorbing layer of this invention, polyethyleneimine, Polyvinyl pyridine, poly dialkylamino ethyl methacrylate, Poly dialkylamino ethyl acrylate, poly dialkylamino ethyl methacrylamide, Poly dialkylamino ethyl acrylamide, a poly epoxy amine, Compounds, these denaturation objects, etc., such as a polyamide amine, a dicyandiamide-formalin condensate, a dicyandiamide poly alkyl-polyalkylene polyamine condensate, poly dimethyl diaryl ammoniumchloride, a polyvinyl amine, and the poly allylamine, can be illustrated. Two or more sorts of these cation resin may be used together if needed. Although especially limitation is not carried out in this invention, below

50 weight sections of the loadings of the water-soluble cation resin contained in an ink absorbing layer are desirable more than 10 weight sections to the pigment 100 weight section. If there is a possibility that the clear nature of an image may fall that the loadings of water-soluble cation resin are under 10 weight sections and 50% is exceeded, although the clear nature of an image improves, desiccation of ink may take time amount and trouble may be caused to the handling of the recording paper after printing.
[0016] In addition, a pigment agent, a defoaming agent, a coloring agent, an antioxidant, an ultraviolet ray absorbent, a viscosity controlling agent, a cross linking agent, etc. are suitably used as an additive according to manufacture conditions, a quality of printed character, and a military requirement.
[0017] 85% or less 70% or more of the opacity of the sheet for record which prepared the ink absorbing layer of this invention is desirable also 66% or more in in 85% or less. When opacity is less than 66% and it is used from a rear face, having applied the beam of light, and the light source is transparent and it is used for the poster for display etc., the light source is transparent and it becomes the bad thing of appearance. Moreover, when an image is illuminated in the reflected light, since the transparency of a sheet is high, reflection of light decreases and the vividness of an image falls. Therefore, the obtained image receives the somber impression and the effectiveness of this invention cannot be expected. Although a clear image is obtained in the reflected light on the other hand when opacity exceeds 85%, since an image with it is not obtained when a beam of light is applied from a rear face, it is unsuitable. [there is little through put of light, therefore sufficiently clear]
[0018] A well-known coating facility of a bar coating machine, an air knife coater, a blade coating machine, a gravure coating machine, etc. is applied to the coating of the ink absorbing layer of this invention. Although the sheet which prepared the ink absorbing layer on the base material can be used as a sheet for record of this invention as it is, it can be processed, for example by the supercalender, gloss calender, etc., and can also give surface smooth nature. The amount of coating of the ink absorbing layer obtained by this invention is determined by the end use, as long as ink absorptivity, color enhancement, and paint film reinforcement are satisfied, it is not necessary to make [many] it superfluously, and from 5 - 40 g/m2, preferably, from the range of 10 - 30 g/m2, it is chosen suitably and used. In many cases, by less than two 5 g/m, ink absorption capacity runs short of ink absorbing layers, an image flows out or color a bleed lump arises, and an image will fade, or desiccation will be slow, ink will adhere to the delivery roll of a printer etc., and it will become dirty. However, if the ink absorbing layer exceeding 30 g/m2 is prepared, since the ink absorbing layer is thick, an adhesive property with UC layer will produce a problem like the loading of a head nozzle in many cases by the ink absorbing layer from which it became weak, and separated and fell, and will become still more expensive also in cost.
[0019] By preparing UC layer to which oil absorption changes from a pigment and a binder (100ml / 100g or less) between the base material of this invention, and an ink absorbing layer, the adhesive property of a base material and an ink absorbing layer becomes good, and the sheet for ink jet record which was more excellent in the reinforcement of a paint film can be obtained. As a pigment used for UC layer of this invention, matter, such as a calcium carbonate, clay, baking clay, the diatom earth, talc, an aluminum oxide, a silica, white carbon, aluminosilicate magnesium, a magnesium carbonate, a barium sulfate, titanium oxide, a zinc oxide, an aluminum hydroxide, a magnesium hydroxide, and an organic pigment (plastics pigment), is illustrated, for example. These pigments can also use two or more sorts together if needed.
[0020] The oil absorption of a pigment has desirable 100ml / 100g or less. When oil absorption exceeded 100ml / 100g and the ink absorbing layer of this invention is prepared on UC layer, the opening of UC layer increases, the detailed spherical matter (bubble) is generated on the front face of the ink absorbing layer which carried out coating on UC layer, and there is a possibility of spoiling the appearance of the recording paper.
[0021] As a binder used for UC layer of this invention Protein, such as polyvinyl alcohol and its derivative, and casein, starch, And conjugated diene system polymer latexes, such as the starch derivative, a styrene-butadiene copolymer, and a methyl methacrylate-butadiene copolymer, Acrylic polymer latexes, such as a polymer of acrylic ester and methacrylic ester, or a copolymer, Vinyl system polymer latexes, such as an ethylene-vinylacetate copolymer, or the carboxyl group of these various

polymers, Functional-group content denaturation polymer latexes, such as a cationic radical, melamine resin, The aquosity adhesives of synthetic-resin systems, such as heat-curing resin, such as a urea-resin, a maleic-anhydride copolymerization resin system, Polyacrylamide system Since macromolecules, such as synthetic-resin system adhesives, such as a polymethylmethacrylate system, a polyurethane resin system, an unsaturated-polyester-resin system, a polyvinyl-butyral system, and an alkyd-resin system, have the good adhesive property with a pigment, they are used preferably. These binders may use two or more sorts together if needed.

[0022] These binders have 10 - 100% of the weight of the desirable range to the pigment 100 weight section, and it is more preferably used in 20 - 80% of the weight of the range. The paint film reinforcement which the adhesion effectiveness with a base material is scarce at less than 10 % of the weight, and the content of a binder considers as a request is not obtained. Moreover, in exceeding 80 % of the weight, a pigment component falls, adhesiveness arises in an under coat layer, and when adopting the manufacture approach which rolls round an under coat layer coating sheet for ink absorbing layer coating preparation, the problem of the blocking which sheets paste up arises. When using an under coat layer and the coater which can carry out coating of the ink absorbing layer continuously, such a problem is not produced, but it may not be suitable when using the usual coater. In addition, a surfactant, a pigment agent, a defoaming agent, a viscosity controlling agent, a cross linking agent, etc. are suitably used according to manufacture conditions and a military requirement as an additive.

[0023] When UC layer is prepared on a base material, it is desirable to make the opacity which doubled UC layer with the base material 60% or less. If opacity exceeds 60%, when carrying out incidence of the beam of light from an ink absorbing layer side and observing from a base material side, since the opacity of parts other than an ink absorbing layer is high, scattered reflection of the light is carried out within a base material and UC layer, and a clear image is not obtained. Furthermore, 15% or more of the opacity with which UC layer was doubled the base material top is more desirable. Since the opacity of parts other than an ink absorbing layer is low when opacity is less than 15%, it is necessary to make the opacity of an ink absorbing layer high. Therefore, when the opacity of an ink absorbing layer becomes high and a printing image is observed in incident light and the reflected light, the somber impression is received and a clear image is not obtained.

[0024] Especially as an approach of preparing UC layer on a base material, it is not limited and can prepare from the former with coaters, such as a well-known bar coating machine, an air knife coater, a blade coating machine, and a curtain coating machine. The amount of coating of UC layer obtained by this invention is determined by the end use, as long as a paint film water resisting property, a recording characteristic, shelf life, etc. are satisfied, it is not necessary to make [many] it superfluously, and its 0.2 - 15.0 g/m2 is desirable, and its 0.5 - 8.0 g/m2 is more desirable. When there are few amounts of coating of UC layer, an adhesive property with a base material is low a little, and there is a possibility that paint film reinforcement may fall. Moreover, when there are many amounts of coating of UC layer, the detailed spherical matter is generated on the front face of the ink absorbing layer which carried out coating on UC layer, and there is a possibility of spoiling the appearance of the recording paper.

[0025]

[Example] Although an example is given to below and this invention is more concretely explained to it, of course, this invention is not limited by this. In addition, that all it is in below with the section and % show solid weight section and solid weight %.

[0026] In the laboratory, 35g[/m] 2 coating of the ink absorbing layer coating -1 was carried out, it dried using the test bar coating machine, on one side of synthetic paper YUPO TPGA-90 (92 micrometers in 38% of opacity, and thickness, Oji-Yuka Synthetic Paper make) of the multilayer structure which consists of polypropylene resin containing example 1 inorganic pigment, the coating layer was formed, and the sheet for ink jet record was manufactured. The opacity of the whole sheet was 67%.

Ink absorbing layer coating-1 amorphous composition silica (the fine seal X-45, particle diameter = 4 micrometers, oil absorption 290 ml/g, Tokuyama make) 100 section binder (PVA420, Kuraray make) 25 section water solubility cation resin (PAS-H-5L, Nittobo make) The five sections [0027] In the

laboratory, 28g[/m] 2 coating of the ink absorbing layer coating -2 was carried out, it dried using the test bar coating machine, on one side of the base material used for example 2 example 1, the coating layer was formed, and the sheet for ink jet record was manufactured. The opacity of the whole sheet was 70%.

An ink absorbing layer coating-2 amorphous composition silica (SAIRISHIA #310, a particle system = 1.5 micrometers, the oil absorption of 310ml / 100g, product made from Fuji SHIRISHIA) 100 section binder; -- silanol denaturation PVA(R-1130, Kuraray make) 20 section binder; -- a nonionic vinyl acetate-ethylene copolymerization latex (the SUMIKA flex time 430 --) Sumitomo Chemical make The ten sections Water-soluble cation resin (PAS-H-5L, Nittobo make) The 20 sections [0028] 25g[/m] 2 coating desiccation of the ink absorbing layer coating -1 which used UC layer coating -1 for the example 1 after 8 g/m2 coating and desiccation in the amount of bones dry at one side of YUPO TPGA-75 (75micro in 32% of opacity, thickness) of the multilayer structure which consists of polypropylene resin containing example 3 inorganic pigment was carried out in the amount of bones dry, and the sheet for ink jet record was manufactured. The opacity of the whole sheet of the opacity of a UC layer + base material was 75% 47%.

UC layer coating-1 calcium carbonate (PC, particle diameter = 3.2 micrometers, the oil absorption of 40ml / 100g, product made from Shiroishi calcium) 100 section binder; denaturation styrene butadiene latex (Nipol LX407C, Nippon Zeon make) The 30 sections [0029] In the laboratory, 18g[/m] 2 coating after 3g[/m] 2 coating and desiccation and of the ink absorbing layer coating -2 was carried out in the amount of bones dry, UC layer coating -2 was dried using the test bar coating machine, on one side of YUPO TPGA-60 (59 micrometers in 30% of opacity, thickness) of the multilayer structure which consists of polypropylene resin containing example 4 inorganic pigment, the coating layer was formed, and the sheet for ink jet record was manufactured. The opacity of the whole sheet of the opacity of a UC layer + base material was 83% 58%.

UC layer coating-2 calcium carbonate (PC, particle diameter = 3.2 micrometers, the oil absorption of 40ml / 100g, product made from Shiroishi calcium) 80 section titanium oxide (kA-10, an anatase mold, particle diameter =0.4micrometer, oil absorption = 20ml / 100g, Titan Kogyo) 20 section binder; denaturation styrene butadiene latex (Nipol LX407C, Nippon Zeon make) The 30 sections [0030] On one side of the base material used for example 5 example 1, UC layer coating -3 was dried in the amount of bones dry, the ink absorbing layer coating -2 was dried 2 coating 25 g/m in the amount of bones dry after 10g[/m] 2 coating and desiccation, and the sheet for ink jet record was manufactured on it. The opacity of the whole sheet of the opacity of a UC layer + base material was 80% 50%.

UC layer coating-3 amorphous composition silica (SAIRISHIA #310, particle diameter = 4 micrometers, the oil absorption of 310ml / 100g, product made from Fuji SHIRISHIA) 100 section binder; denaturation styrene butadiene latex (Nipol LX407C, Nippon Zeon make) 10 section binder; silanol denaturation PVA (R-1130, Kuraray make) The 20 sections [0031] In the laboratory, 15 g/m2 coating of the ink absorbing layer coating -1 was carried out, it dried using the test bar coating machine, on one side of YUPO FPG-60 (60 micrometers in 87% of opacity, thickness) of the multilayer structure which consists of polypropylene resin containing example of comparison 1 inorganic pigment, the coating layer was formed, and the sheet for ink jet record was manufactured. The opacity of the whole sheet was 98%.

[0032] In the laboratory, 22 g/m2 coating after 12 g/m2 coating and desiccation and of the ink absorbing layer coating -1 was carried out in the amount of bones dry, UC layer coating -4 was dried using the test bar coating machine, on one side of the base material used for example of comparison 2 example 3, the coating layer was formed, and the sheet for ink jet record was manufactured. The opacity of the whole sheet of the opacity of a UC layer + base material was 88% 75%.

UC layer coating-4 calcium carbonate (PC, particle diameter = 3.2 micrometers, the oil absorption of 40ml / 100g, product made from Shiroishi calcium) 50 section titanium oxide (kA-10, an anatase mold, particle diameter =0.4micrometer, oil absorption = 20ml / 100g, Titan Kogyo) 50 section binder; denaturation styrene butadiene latex (Nipol LX407C, Nippon Zeon make) The 40 sections [0033] In the laboratory, 10 g/m2 coating of the ink absorbing layer coating -3 was carried out, it dried using the test

bar coating machine, on one side of the base material used for example of comparison 3 example 4, the coating layer was formed, and the sheet for ink jet record was manufactured. The opacity of the whole sheet was 52%.
Ink absorbing layer-3 amorphous composition silica (BS304N, particle diameter =9micrometer, oil absorption = 190ml / 100g, Shionogi make) 100 section binder; silanol denaturation PVA (R-1130, Kuraray make) The 40 sections [0034] The evaluation result of having performed the following evaluations for the sheet property to Table 1 about each obtained coating sheet sample is shown in Table 2.
[0035] (Opacity) The measuring method of opacity was based on the approach indicated by JIS-P -8138.

(Vividness 1 of coloring by incident light: Light a base material side incidence) It turned to the 100W fluorescent lamp side, and the base material side was detached 5cm, and was stretched [it printed with the ink jet plotter (product made from design jet-650 C:H.P.), and], and organic-functions evaluation of the vividness of coloring from the distance of 1.5m was carried out from the rear-face side. The vividness of coloring evaluated coloring of yellow, a Magenta, and the color ink of cyanogen by viewing. Although it was good, although it was a little inferior, ** showed O and the thing which is satisfactory practically, and x showed [the good thing] the still poorer thing for O and the thing which is inferior a little.
[0036] (Vividness 2 of coloring by incident light: Light an ink absorbing layer side incidence) It turned to the 100W fluorescent lamp side, and the ink absorbing layer side was detached 5cm, and was stretched [it printed with the ink jet plotter (product made from design jet-650 C:H.P.), and], and organic-functions evaluation of the vividness of coloring from the distance of 1.5m was carried out from the rear-face side. The vividness of coloring evaluated coloring of yellow, a Magenta, and the color ink of cyanogen by viewing. Although it was good, although it was a little inferior, ** showed O and the thing which is satisfactory practically, and x showed [the good thing] the still poorer thing for O and the thing which is inferior a little.
[0037] (Vividness of coloring by the reflected light) It printed with the ink jet plotter (product made from design jet-650 C:H.P.), and organic-functions evaluation of the vividness of coloring when illuminating a 100W fluorescent lamp from the distance of 1m was carried out from the printing side. The vividness of coloring evaluated coloring of yellow, a Magenta, and the color ink of cyanogen by viewing. Although it was good, although it was a little inferior, ** showed O and the thing which is satisfactory practically, and x showed [the good thing of coloring] the still poorer thing for O and the thing which is inferior a little.
[0038] (Light source of incident light) It turned to the 100W fluorescent lamp side, and the base material side was detached 5cm, and was stretched, and viewing estimated whether from a rear-face side, from the distance of 1.5m, incident light would be transparent and it would be visible. Although it was visible, ** showed that which O is transparent in a good thing, and O and whose incident light are transparent a little in what is inferior a little although it is good, and is satisfactory practically, and x showed the still poorer thing.
[0039] (Paint film reinforcement) After sticking a cellophane tape (Nichiban make) on a coating stratification plane, it removed in the direction of 180 degree, and organic-functions evaluation of whether a coating layer separates was carried out. Although it was good, although it was a little inferior, ** showed O and the thing which is satisfactory practically, and x showed [the good thing] the still poorer thing for O and the thing which is inferior a little.
[0040] (Blank paper appearance) There is no detailed spherical object etc. in the coating side of the created ink jet record sheet, and viewing estimated whether a blank paper appearance would be good. Although it was good, although it was a little inferior, ** showed O and the thing which is satisfactory practically, and x showed [the good thing of a blank paper appearance] the still poorer thing for O and the thing which is inferior a little.
[0041]
[Table 1]

	支持体の不透明度 %	ＵＣ層の有無	ＵＣ層の顔料の吸油量 100ml/100g	基材＋ＵＣ層の不透明度 %	シート全体の不透明度 %
実施例１	３８	無	—	３８	６７
実施例２	３８	無	—	３８	７０
実施例３	３２	有	４０	４７	７５
実施例４	３０	有	40/20	５８	８３
実施例５	３８	有	３１０	５０	８０
比較例１	８７	無	—	８７	９８
比較例２	３２	有	２０	７５	８８
比較例３	３０	無	—	３０	５２

[0042]
[Table 2]

	画像の鮮やかさ			入射光の光源	塗膜強度	外観
	入射光(1)	入射光(2)	反射光			
実施例１	◎	◎	◎	◎	○	◎
実施例２	◎	◎	◎	◎	○	◎
実施例３	◎	◎	◎	◎	◎	◎
実施例４	◎	◎	◎	◎	◎	◎
実施例５	◎	◎	◎	◎	◎	○
比較例１	×	×	◎	◎	○	◎
比較例２	×	×	◎	◎	◎	◎
比較例３	△	△	×	×	○	◎

[0043]
[Effect of the Invention] As shown in Table 1, the sheet for ink jet record of this invention has ** and ** of an image also in any of incident light and the reflected light, and excelling in quality, such as an appearance in a blank paper and paint film reinforcement, was checked.

[Translation done.]